Green Industry Sector Strategy for Ontario

Developed by

THE GREEN INDUSTRY MINISTERIAL ADVISORY COMMITTEE *(GIMAC)*

April 1994

CHAIR'S MESSAGE

The early 1990s have been a very difficult period for Ontario. During this period worldwide competition has forced many of our plants to close and future prosperity now rests on our ability to foster industries that can succeed in a rapidly changing world economy.

Ontario has a strong base in green technologies and environmental businesses are growing significantly faster than other sectors of the economy. As such, the providers of environmental goods and services, the so-called Green Industries, must be considered as one of the potential new engines of growth for Ontario.

Recognizing this growth opportunity, the Ontario Government created the Green Industry Ministerial Advisory Committee (GIMAC), supported by an excellent team from the MOEE, to develop a strategy and to identify initiatives to strengthen the green industrial base.

The Committee consisted of exceptional Ontarians from a wide variety of backgrounds. In October 1993, the Committee began developing its recommendations, working rapidly as the government had requested completion of its report early in 1994. This report is the result of an intense dedicated effort by the Committee and its support staff over a relatively short amount of time.

The recommendations of the Committee are the fruits of our hard work. Once implemented, these recommendations will create many thousands of skilled jobs in Ontario, will safeguard our environment and will help to ensure the sustainability of our industrial base. In fact, their implementation will ultimately result in a re-engineered Ontario where our citizens will lead healthy, prosperous lives in harmony with nature.

These recommendations are generally strategic realignments that will cost relatively little and may even save money. In this age of necessary government restraint, this too was important to the Committee.

So all in all, I am proud of the work of the Committee. We completed our assignment on time, found cost effective recommendations that will generate a new future for Ontario, and the Committee members worked without pay. May Ontario always get such good value for its expenditures.

Dr. Andrew Benedek
GIMAC Chairman

Green Industry Sector Strategy

I Executive Summary

BRIEF DESCRIPTION OF ONTARIO'S GREEN INDUSTRIES

The green industry sector is comprised of companies whose primary source of revenue is derived from delivering environmental solutions to others. Green industry refers to the technologies, goods and services which promote: (a) environmental protection; (b) water and energy conservation/efficiency, waste reduction/reuse/recycling (3R's); remediation; and (c) pollution prevention. Green industries will continue to grow with emerging technologies.

Green industries provide solutions, through innovative technologies and re-engineered processes, to global and local environmental threats such as climate change and diminishing clean water supplies. The adoption of green technologies and practices by other economic sectors in Ontario strengthens industry and makes our economy more environmentally sound. Support for the green industry sector will move Ontario closer to sustainable development by simultaneously advancing pollution prevention and resource conservation, as well as Ontario's economic development goals. Green industries are an instrument for the development and diffusion of environmental technologies and skills throughout the broader economy and will function as a primary agent of restructuring for sustainability.

A VISION FOR ONTARIO'S GREEN INDUSTRY SECTOR

The Green Industry Ministerial Advisory Committee (GIMAC), with representation from industry, business, labour, and environmental organizations, has been established to steer the development of a formal Green Industry Sector Strategy for Cabinet review. GIMAC has defined our vision for Ontario's green industry sector in the following terms:

Green industry is an internationally recognized and competitive provider of innovative environmental goods and services creating sustainable, ecological, social and economic improvement for the Ontario of tomorrow.

During the fall and winter of 1993/94 GIMAC held a number of meetings to discuss sector definition including strengths, weaknesses, opportunities and threats, to identify strategic goals for the sector and to develop recommendations for strategic initiatives which will help achieve this vision.

SUMMARY OF GIMAC RECOMMENDATIONS

To enable Ontario's green industry sector to reach its maximum growth potential and fulfill GIMAC's vision, eleven recommendations have been developed. These recommendations are based on our belief that over time and under the right framework, applying environmental solutions will benefit suppliers of green products and

services, user industries requiring these solutions, and the natural environment of which we are a part. To reach our vision, Ontarians must re-engineer the way we produce goods and services and adopt environmentally aware lifestyles. In essence, this means Ontarians can employ green technologies in order to move towards a world where environmental and economic goals are compatible and consistent.

It is the Committee's belief that these recommendations, if adopted, will allow Ontario to become a world leader in fostering a strong green industry. Ontario green industry will benefit from new export markets, new high quality, skilled jobs, and a secure environment for future generations. GIMAC presents four categories of recommendations which will start us in that direction:

A. Support the Use of New Green Technologies and Practices

Recommendation 1: Devise a certification scheme for environmental technologies and then support it.

Recommendation 2: Encourage procurement relationships between Ontario's green industry and provincial, regional and municipal governments and crown corporations.

Recommendation 3: Use Ontario's industrial programs to support green R&D and to encourage green technology.

B. Align Ontario Government to Facilitate the Use of Environmental Technologies

Recommendation 4: Ensure environmental policies, programs and regulations are clear, progressive and consistently enforced.

Recommendation 5: Develop policy and a regulatory system that is open to new technologies.

Recommendation 6: Encourage the use of economic instruments when developing regulations.

C. Ensure that Ontario Green Industries Have Support Mechanisms Equal to or Better than Other Jurisdictions

Recommendation 7: Participate with the federal government to maximize support for Ontario green industries.

Recommendation 8: Develop export markets using market intelligence and consortia.

Recommendation 9: Devise cost effective mechanisms and incentives to help finance Ontario's green industries.

D. Diffuse Environmental Technologies and Practices Through Communities and Industries.

Recommendation 10: Develop training initiatives which accelerate the greening of industries and communities.

Recommendation 11: Instill environmental values and principles of stewardship at all education levels.

OUR MEASURE OF SUCCESS

These recommendations are designed to get Ontario on the road to achieving the GIMAC vision. Each measure aims to produce maximum results for the lowest possible cost. Our measures of success will be in both economic and environmental terms: the number of high quality, well paid jobs generated; increased sector growth rate and exports; improved environmental quality; and a healthier, more sustainable economy. The employment generated from new green industries, along with improvements in air and water quality and resource conservation, are benefits that should significantly exceed the cost of implementing this strategy. Achieving the GIMAC vision will ensure ecological, social and economic improvement in Ontario for future generations. All stakeholders - industry, business, government, labour and the environmental community - must work together **now** to make GIMAC's vision a reality, while this window of opportunity is still open to Ontario's Green Industries.

II Profile and Analysis of Ontario's Green Industries

1. DEFINING ONTARIO'S GREEN INDUSTRIES

The green industry sector is comprised of companies whose primary source of revenue is derived from delivering environmental solutions to others. Green industry refers to technologies, goods and services which promote: (a) environmental protection; (b) water and energy conservation/efficiency, waste reduction/reuse/recycling (3R's), remediation; and (c) pollution prevention.

Green industries provide solutions, through innovative technologies and re-engineered industry processes, to global and local environmental threats such as climate change and diminishing clean water supplies. The adoption of green technologies and practices by other economic sectors in Ontario strengthens industry and makes our economy more environmentally sound. Support for the green industry sector will move Ontario closer to sustainable development by advancing pollution prevention, resource conservation and economic development goals.

This sector is difficult to define in quantitative terms. First of all, it is largely an emerging industry which is constantly evolving from end-of-pipe technologies and environmental protection through to conservation/efficiency and 3Rs technologies and finally to pollution prevention. Second, green industries encompass many unrelated subsectors such as recycled wood products, energy efficient lighting, telecommunications, high efficiency motors and consulting engineers. Our markets include the industrial-commercial-institutional (ICI), government and the residential-consumer sides of the economy.

The green industry sector as a whole is not well documented. This problem has also been identified by both the Federal Environment Industry Strategy for Canada and the U.S. Environmental Technologies Exports strategy papers. There are a limited number of sector studies which concentrate on the narrow subsector of environmental protection that supplies the ICI market only. However the conservation, efficiency, 3Rs and pollution prevention subsectors for all user markets are not described in these studies. As of March 1993, Statistics Canada did not track data regarding even the more mature environmental protection sub-sector (Ernst & Young, 1993). The industry itself only recently established its national and Ontario industry associations to champion broader industrial development issues on behalf of this sector.

Like most emerging sectors, green industries are comprised mostly of small and medium sized companies that are starting to restructure and consolidate in order to combine strengths and achieve economies of scale. Only 25% of Ontario's environmental protection subsector had 1990 sales of more than $2 million (Ernst & Young, 1992). Since industries in the conservation/ efficiency, 3Rs and pollution prevention sectors are still emerging, these sectors are believed to be even more heavily weighted to small firms.

The Ontario **environmental protection** subsector was recently documented in a 1992 Ernst and Young report. This study found that about 40% of the Canadian environmental protection subsector is located in Ontario. This subsector alone employs more people than both the pulp and paper and the chemicals sector in Ontario, ranking third in Ontario industry sectors overall. It is fast growing (about 8% per annum) with annual revenues of about $2.5 billion. The sector employs approximately 30,000 people in Ontario and comprises about 1,500 to 2,000 firms. Approximately 15% of sales combined products and services) are exported, primarily to the U.S. In environmental products, Ontario capability is particularly strong in the areas of: water pollution control; solid and hazardous waste handling and treatment; air pollution control; and control, sampling and monitoring equipment. On the service side, which accounts for about 75% of all environment protection sales, the largest segments are: consulting engineering; environmental consulting; solid and hazardous waste management and recycling services; pollution assessment and control; and laboratory services. Other services include environmental auditing and assessment.

The **water and energy conservation/efficiency** subsectors of green industries promote the efficient and economical use of energy and water. It is usually the case that water and energy conservation go hand in hand. For example, when hot water use in an industrial process is reduced, energy costs for heating the water are also reduced. These double benefits are prevalent in the industrial, commercial, institutional and residential markets. Energy service companies (ESCOs), and firms which provide high efficiency motors and lighting, low flow toilets, efficient appliances and windows, smart irrigation systems, and water recirculation systems are some examples of products and services in this subsector.

As an indication of the size of this subsector, the ESCO industry alone consists of 19 companies employing about 400 people in Ontario. These companies generated about $150 million in sales in 1993. However, the market in Canada alone for energy performance contracting is estimated to be at least $5 billion, with the potential for ESCO services in the federal government facilities alone valued at about $800 million (Canadian Association of ESCOs, 1994). This sector's potential size versus its actual sales is further evidence of the emerging nature of green industries.

There are a number of other subsectors related to water conservation and energy efficiency. The **renewable energy** subsector deals with solar, biomass, wind, small-scale hydro and tidal energies, while the **alternative energy** subsector deals with transportation fuels.

The **3R's** subsector deals with technologies, services and products that help reduce the initial production of wastes, or support the reuse or recycling of a material that still remains at the end of its life-cycle. Since solid waste management is a priority in Ontario we have generated a number of leading edge 3Rs developments such as in-vessel composting and rubber tire recycling technologies. Ontario also has Canada's largest capacity for paper and paperboard recycling, with some plants using proprietary technology for recycling cardboard into fine paper. (Forestry - Ontario Round Table, 1992)

Pollution prevention addresses the opportunity to reduce or eliminate wastes or pollutants, including toxics, at source, through changes in traditional industrial processes, materials substitution and human behaviour. Pollution prevention is generally less costly, on a long term basis, and more environmentally effective than the abatement or remedial actions that take place after pollution has been generated. Energy and raw materials are used more efficiently by re-engineering processes to reflect the life cycle costs of materials used. New materials and substitutes such as recyclable chemicals, high-efficiency machinery, computer information systems and staff training are employed to achieve pollution prevention. Ecological engineering, for example waste water treatment using wetlands and agricultural engineering, is an important and emerging new engineering practice.

Infrastructures and industries incorporating pollution prevention continue to emerge in Ontario. The continued growth of the **telecommunications network** in Ontario will reduce energy and paper consumption on a provincial level. Changes in urban design and transit systems will significantly reduce Ontario's future transportation demands. Integrated Pest Management (IPM) techniques and Low-Input Sustainable Agriculture (LISA) practices are being increasingly applied on Ontario's farms. For example, IPM techniques have reduced pesticide use in Ontario's apple orchards by 60% with costs per hectare dropping from $1240 to $547/hectare (Ontario Round Table - Agriculture and Food -1992). All of these areas offer enormous economic and environmental benefits and opportunities for Ontario suppliers.

The Growing Market for Ontario's Green Industries

Given the emerging and undeveloped nature of green industries it is only meaningful to estimate market size in orders of magnitude. Preliminary calculations suggest that Ontario's broader green industry market (which includes the subsectors described above) was between $6.8 and $10.4 billion in 1992, which translates to about 2.3% and 3.5% of Ontario's GDP (Arthur Donner, April '92). The Ernst and Young report estimated Ontario's environmental protection subsector revenues at $2.5 billion in 1990. The relative size of the environmental protection market compared to that of green industries ($2.5 billion versus $6.8 billion to $10.4 billion) strongly reinforces the need to recognize the broader sector in any long-term sector development plan.

Market forecasts for the global environmental protection subsector provide an indication, again in orders of magnitude, of the overwhelming opportunity for the broader green industries sector. "The current world market for environmental equipment and services is estimated at about $200 billion which is forecast to increase at an average annual rate of 5 to 6 percent per year to $300 billion by the year 2000". Canada's growth rate is pegged at about 8% with a 1990 market size of US$ 7 billion (OECD 1992). The American market will grow at a 6% rate based on the 1992 market of US$134 billion. Smaller but emerging markets such as Southeast Asia are growing at 16% from a US$6 billion figure in 1992 (Environmental Business Journal, 1993). All growth forecasts for these sectors indicate that the market for environmental goods and services in Ontario will continue to expand at a greater rate than the provincial GDP.

Key Influences and Issues for Green Industries' Structure and Size

Ontario's green industry sector reflects a dynamism which is currently found in few other sectors of the economy. The strength of this sector is largely dependent upon the amount and enforcement of environmental legislation and the size of the industrial and population base in a region (Ernst & Young, 1993). The rate of growth in the broader economy determines the demand for green goods and services in new plants and facilities to ensure regulatory compliance. Population growth stimulates demand for infrastructure and related services. Through pollution prevention technologies, energy and water efficiency and the 3R's, needs of more people can be met while demands on the environment can be reduced. The adoption of these technologies will enable Ontario to do more with less and will also create opportunities for green industries. The strong and continued public demand for environmental stewardship has resulted in consumer demand for environmentally-friendly products and increased corporate environmental responsibility.

Government regulations are a critical stimulant for this sector. The progressive nature of environmental legislation, the degree to which it is enforced and the number of regulated industries in the province influence the size and strength of the sector. Numerous studies indicate that those jurisdictions with the most stringent environmental laws tend to produce a larger number of environmental companies and broader range of environmental technologies. For example, progressive national environmental legislation was instrumental in developing Germany's current strength in water and effluent treatment, Japan's capability in air pollution control and American expertise in hazardous waste treatment (Sentar, 1993).

The desire for stringent and enforced environmental regulations can create conflict with other economic sectors - the regulated industries. For example, legislative changes such as updating the Energy Efficiency Act and the Plumbing Code, developing MISA effluent standards, and phasing out organochlorine substances in mill effluent create opportunities for green industries, but can be costly for other regulated industries. GIMAC is sensitive to this concern but maintains that strong environmental legislation consistently enforced will lead both to a more dynamic green industry sector and stronger, more efficient and sustainable regulated industries. It should also be noted that when firms adopt process changes in response to new environmental requirements they often experience a positive return on investment (OECD 1985).

The environment protection sector is undergoing some restructuring and consolidation, with a number of smaller firms being acquired or merging. (Ernst & Young, 1993). The environmental protection industry subsector is being challenged to adapt and innovate in response to the demand for pollution prevention technologies. As more and more jurisdictions and markets demand integrated environmental approaches and "closed loop" systems, markets for "end of pipe" pollution control will decline.

2. CHALLENGES AND KEY SUCCESS FACTORS FOR ONTARIO'S GREEN INDUSTRIES: A SWOT ANALYSIS

The four fundamental ingredients of healthy green industry sector - human resource, markets, technology and financing - are used to assess our strengths, weaknesses, opportunities and threats (SWOT).

HUMAN RESOURCES

Strengths:

Our sector employs a wide range of people including highly educated professionals with specialized environmental skills, engineers and lab technicians with base skills also common to other industries, and semi-skilled equipment operators.

Ontario has a strong educational system which supports the skills and technical knowledge required by this sector. Undergraduate and community college level enrolment in environmental science and engineering has risen in recent years, although there has been little growth in the numbers of graduate level degrees earned in the science and engineering fields (Ernst & Young, June 1992).

Employment growth in our sector has been strong. For example, employment increased an average of 8 per cent annually for Ontario's environmental protection industry between 1986-90 (Ernst & Young, 1992). These trends are expected to continue. According to a Canada-wide survey of environmental companies in 1992, 90 per cent of hazardous waste companies, 70 per cent of consulting firms, and more than 50 per cent of laboratories predict employment growth during the next five years. Human resource strengths which have contributed to this growth include: highly skilled people producing good quality work in Ontario labs; high quality people and technology in the sampling and monitoring equipment subsector; and our international reputation as trustworthy business people (Ernst & Young, 1992).

Government regulations, labour organizations and broad public concern about the environment have contributed to the skill level of people working in the sector. For example, environmental scientists and engineers are needed to respond to the increasing demand for environmental impact assessments and audits. Unions have played an important role in advancing environmental knowledge and skills training with strong programs on health and safety in the workplace.

Another strength is the fact that, although the quality of Ontario engineers and scientists in this sector is consistent with other jurisdictions, salary levels are lower than our major competitors because of the current value of the Canadian dollar. As such Ontario companies with significant levels of engineering and scientific staff (e.g. engineering services and products, R&D) enjoy an important competitive advantage in hiring Ontario-based staff.

Weaknesses:

Managers in our sector tend to be scientists and engineers and many lack management training in areas such as marketing, human resource management, strategic planning, communications and public relations. Such management skills are critical for small firms which are expanding into foreign markets. Specialized educational programs which combine technical and managerial training, such as the new one-year program in technology management at Queens University, are scarce.

At the same time industry surveys indicate the sector would benefit from a greater supply of technical specialists with specific skills. Examples include: hydrogeologists, toxicologists, legislative experts, site remediation experts, senior physical scientists and analytical chemists with business skills, and professionals with foreign language skills (Ernst & Young, 1993). Industry also reports difficulties recruiting staff with more than ten years of environmental experience - the majority of workers tend to be in age 20-34 category.

Employment growth is expected to be weak in some subsectors. For example, little job growth is expected in the environmental manufacturing subsector and the solid waste management subsector over the next five years (Ernst & Young, 1993). Much of our existing supply capabilities are focused on end-of-process technologies - there is a need to shift capabilities toward pollution prevention, waste reduction, reuse or recycling, and energy efficiency.

The structure of our sector - diverse subsectors and many small companies - limits human resource training. As a sector we are not always able to identify and address common human resource issues, and small companies lack the resources to offer internal training programs.

Opportunities:

The strong employment growth expected for our sector represents an opportunity both for semi-skilled and skilled workers in Ontario. An industry survey estimates that between 1993 and 1995 environmental industries across Canada will require an additional 5,000-7,000 workers, of which about 3,000 will be technically-skilled workers and management (Ernst & Young, 1993). If one calculates the Ontario portion of the national figure and includes the energy-conserving sector one can estimate that employment in Ontario green industry will grow by 3,000-4,000 jobs by 1995.

Continued growth will depend largely on the availability of technically-skilled workers. Employment opportunities will be created by export market activity to the extent that currently active firms expand and others successfully form consortia to penetrate foreign markets.

New environmental legislative initiatives and regulations will require new skills and more environmental specialists to meet these requirements. For example, Ontario's Environmental Bill of Rights is likely to increase the need for people who can conduct environmental audits, carry out monitoring and testing, develop emergency response planning systems and geographic information systems.

The restructuring underway in Ontario's manufacturing sector has led to large

numbers of displaced workers who could take advantage of these opportunities. Retraining programs may well be needed, given that most workers in the green industry sector require specific education and training to carry out their jobs. Women are very under-represented in our sector and efforts to encourage more women to enter science and engineering fields would help meet human resource requirements (Ernst & Young, 1992).

Threats:

The declining graduation rate from science and engineering programs in universities, colleges and technical institutes presents a threat to our sector. Given anticipated sector growth difficulties many companies have finding technically skilled employees will increase (Ernst & Young, 1993). As well, a shortage of people with combined technical knowledge and managerial experience is a threat to the sector. The Canadian Council for Human Resources in the Environment Industry was recently established to help address these human resource weaknesses.

There is also a concern that the North American Free Trade Agreement (NAFTA) may be a threat to the sector. Ontario companies competing with Mexican operations with lower labour rates and lower workplace health and safety standards could find their viability undercut and be forced to relocate to Mexico. This diversion of production and investment from Ontario to jurisdictions with lower environmental and labour standards will in turn put pressure on Canadian governments to cap or weaken environmental regulations and employment standards (CELA, 1993).

MARKET ACCESS AND DEVELOPMENT

Strengths:

Ontario's Green Industries have had some notable successes in accessing both domestic and export markets. In the environmental protection industries subsector of Green Industries, Ontario firms supply about 90% of Ontario's market for services and about 75% of Ontario's demand for goods. As well, over 25% of product sales and from 10 to 15% of service sales in this subsector go to out-of-province and export markets. The most common export markets are the U.S. (especially the Northeast), and Western Europe (Ernst & Young, 1992). Provincial and federal governments' export support programs and foreign trade offices are identified as a valuable asset in achieving these export sales.

The province's strong resource industries sectors, such as hydro-electrical, forestry and mining, have provided a large domestic market for nurturing new green industries. Ontario's public sector is also a major market development partner, through its numerous environment and conservation policies and programs. Ontario's worldwide competitiveness in water treatment and purification, waste management, and monitoring and control equipment, bear testimony to the importance of having a strong domestic market in order to compete globally.

Ontario has a number of advantages over foreign competitors when targeting foreign markets. Ontario's global reputation for having a strong environmental ethic has been

a valuable asset when establishing new export clients. Canada's geographic and cultural proximity to the U.S is one reason that the largest green industries market in the world is also our biggest export market; however Ontario exporters also benefit from a favourable reputation in the U.S. for being leaders in environmental protection. "Sellers from Ontario are seen to be credible and their claims believable if they can point to success of Ontario projects." (Redma, 1991). Our second largest export market is Western Europe, where Ontario benefits from a European preference for dealing with Canadian suppliers over other North Americans. Ontario firms believe their customer-service focus and ability to provide smaller, tailored solutions have been an advantage when competing with US suppliers.

Weaknesses:

Ontario's green industries face a constant barrier in the domestic market because of Canada's foreign dominated manufacturing economy. Foreign controlled companies account for 48% of all Canadian manufacturing revenues (G&M Jan. 18'94). Buying decisions for new environmental goods and services or for advanced green technologies tend to be made at corporate headquarters and not in Canadian branch plants. Ontario's green industries have to learn to penetrate foreign purchasing centres and this can be difficult for smaller companies. This tends to limit opportunities to develop a track record at home before targeting offshore markets.

Neither the Ontario nor the Canadian market alone is large enough to support domestic suppliers, therefore Ontario's green industries must gain access to international markets in order to reach the economies of scale necessary to survive. Offshore marketing is costly and Ontario's firms often lack the required market intelligence. This scenario is quite different from our American competitors. Most U.S. firms do not need to seek export markets because their domestic market is large enough - in 1992 the U.S. only exported 10% of its production of environmental goods and services (Environmental Technologies Exports: Strategic Framework for U.S. Leadership, 1993).

The prevalence of small and medium-sized companies in Ontario's green industry sector is often a barrier to accessing markets. While more than 75% of Ontario's environment protection firms have annual sales of less than $2 million, only 55% of Europe's environmental firms have sales less than US$2.5 million ($3.2 million Canadian). Smaller companies have limited resources for penetrating export markets and generally do not benefit from the economies of scale required to compete in export markets (Economist, Nov.'93).

Delays in government decision making, inconsistent implementation of regulations and policies, reduced enforcement, and shifting environment policy priorities, make it difficult for suppliers to anticipate client needs and prepare for emerging markets. Ontario's regulations must be at least equal to targeted foreign markets (e.g. the United States) in order for home grown technologies to be exported (Ernst & Young, 1992). The Porter Commission study noted that Canada lost a good portion of its domestic environmental technologies market to foreign suppliers when it failed to update regulations in key sectors until years after the comparable standards were raised in the US and Europe.

Ontario's green industries face an inordinate amount of local market fragmentation. There is a myriad of overlapping regulations that have an impact on green industries, originating from multiple government authorities. This fragments an already small domestic market and confuses our potential clients. Because there is no coordinated system of standards and guidelines for green products, services and technologies, Ontario's suppliers repeatedly must prove themselves to each new client. There is also no coordinated system to link firms requiring specific environmental technologies with those firms which can supply them. Canadian suppliers are often deprived of a Canada-wide market because of interprovincial trade barriers. American, German and Japanese suppliers are serious competitors who have prospered from their large domestic market base.

Opportunities:

There are a number of strategic directions for market development that our sector should explore. Ontario enjoys a favourable environmental reputation abroad but the fact is that we in Ontario are not efficient users of our natural resources. For example, Canada uses more energy per dollar of output than any other major industrialized country (Energy Sectoral Task Force Report, Ontario Round Table on the Environment and Economy, 1992). This presents an opportunity for us to convert our wasteful economy while providing a test market for offshore sales. Ontario's green industries could partner with the solid environmental movement in our communities to better educate consumers on environmental issues and the role that Ontario's technology can play in the environmental movement. Ontario's strong organized labour movement could become an important partner for this sector by stimulating demand through green technology training programs for its members.

Our sector also can capitalize on a number of recent national developments. We must respond to our new federal government's interest in this sector by partnering federal priorities such as CFCs and global warming with Ontario's capabilities to develop world class technologies. In 1993, the International Standards Organization (ISO) assigned Canada to act as the Secretariat for its technical Committee on Environmental Management (ISO-TC207). The Canadian Standards Association in Toronto is administering this Committee on behalf of Standards Council of Canada who represent Canada at the ISO level. This activity may prove valuable for developing Ontario environmental management standards against an international benchmark. NAFTA will provide Ontario's suppliers new opportunities to bid on an equal basis with American firms for U.S. Department of Energy and Army Corps of Engineers contracts. As well, NAFTA now extends access to service contracts over US$50,000 for most federal agencies, where access was previously limited to goods only - most environmental remediation contracts are considered to be service contracts (U.S. Environmental Market Newsletter, Foreign Affairs, Jan'94).

The U.S. has recently released its own export strategy for environmental technologies. Many of the actions being proposed will in fact enhance accessibility to its own markets, through streamlined bureaucracies and efforts to strengthen domestic markets. The strategy identifies Japan and Germany as its critical competitors and Mexico and Latin America as its new frontier (Environmental Technologies Exports: Strategic

Framework for U.S. Leadership, 1993). This leaves Canada's exporters with a back door entry to U.S. domestic markets. Ontario suppliers should be aware of the implementation of this export strategy and be positioned to capitalize on U.S. plans for intelligence gathering and the coordination of regulatory and technology support programs.

The largest portion of green industry purchases continues to be made by the public sector municipal and provincial levels, both at home and abroad, for infrastructure projects in water distribution and treatment, waste and energy management and clean technologies. Ontario's green industries and the public sector can establish a strategic procurement relationship through long-term planning and information exchanges, in order that these products and services can be supplied locally. Since this approach does not exclude importers from the bidding process, it would not violate trade agreements. Examples where strategic planning in procurement can be applied are in the area of long-term water consumption technologies such as efficiency and metering products, or nuclear waste management solutions.

The Green Communities Program and Green Industrial Analysis and Retrofit Program (see Appendix I for details) will play a critical role in expanding Ontario's industrial and residential markets for green technologies. Our sector must position itself so that we are the dominant suppliers to these new domestic markets.

Threats:

Ontario firms must establish business partnerships to mitigate the competitive challenges presented by multinationals who are now joining this sector. With extensive research and technical resources, these competitors can offer clients full service turnkey solutions while most of our firms are small and medium-sized, niche oriented companies.

Ontario is competing with jurisdictions that have better developed partnerships between industry and government and use government policy and regulatory framework to make industry more competitive. The implications of success for the proposed U.S. national strategy are clear - either Ontario must create similar advantages for our sector or risk losing our home market to larger and more organized competitors. Successful industry-government partnerships for regulatory and export promotion programs in Holland, Germany and Japan have contributed to their worldwide leadership in this market.

There are numerous examples where regulatory inaction has eroded our domestic market and our ability to gain access to international markets. The most commonly cited example is our lack of an equivalent to the U.S. Clean Air Act in Ontario. "The major U.S., European and Japanese firms that are consolidating the global equipment market have generally developed technologies in response to particular regulatory requirements in their home market." (Ernst & Young).

NAFTA could threaten green industries because it "removes or frustrates many industrial policy tools which might promote sustainability." (CELA, 1993). NAFTA could limit the ability of governments to support specific sectors through industrial programs that tie grants or loans to Ontario-based companies. As well, it is argued that

NAFTA may facilitate the relocation of multinationals to lower standard regions, which will then force lower standards in order to maintain industrial investments in other regions. "The harmonization of environmental standards under NAFTA may pose a barrier for any jurisdiction which wishes to establish standards which go beyond the "harmonized" level. This constraint on the ability of individual jurisdictions to develop and adopt standards independently may, among other things, limit the degree to which environmental innovation can be induced within particular jurisdictions through regulatory measures."(CIELAP 1994).

TECHNOLOGY ACCESS

Strengths:

Ontario has excellent institutional research capabilities in its university facilities across the province. The universities of Guelph, McMaster, Toronto and Waterloo have developed world class expertise in the waste water treatment area. The Ontario Centres of Excellence, such as the Waterloo Centre for Groundwater Research and the Ontario Centre for Materials Research, link industry and academic research and provide industrial support for technological innovation.

The newly-established Ontario Centre for Environmental Technology Advancement (OCETA) will help make Ontario's academic research and expertise more accessible to industry. The Centre responds to needs identified by small and medium-sized Canadian companies. These firms suffer from poor access to technology, business, regulatory, financial, educational and management support services when commercializing environmental technologies, products and services. With head offices in Toronto and regional offices in Hamilton, Ottawa and Kitchener-Waterloo, OCETA's business support services will be a vital resource for green technology development and commercialization in Ontario.

Ontario's engineering community is becoming a leader in integrated (energy, waste, and water) audits for industry. The integrated approach is not new to the commercial and institutional sectors; however it is novel in the industrial sector. Integrated audits identify extensive greening opportunities for a facility with enhanced paybacks over traditional single media audits (Engineering Dimensions, Jan-Feb 1993). Ontario's engineering strengths, combined with the energy and water-intensive nature of many of our resource-based industries, provide a basis for Ontario becoming a world leader in this field.

Weaknesses:

A recent survey of Ontario suppliers of technology-based products and services as well as possible investors, identified confusing and unpredictable regulations and lack of economic access to pilot and demonstration facilities as barriers to commercialization of environmental technology (Doyletech 1992). Successful technology commercialization depends on the level of R&D investment and on the ability to move quickly and unimpeded through the technology development cycle of basic research, to applied research, to demonstration and finally to sales.

There is a dangerously low level of corporate R&D in Ontario and Canada. "Such countries as the U.S. and Germany spent more than 2.8% of their gross domestic product on R&D in 1990, while Japan spent 3.1%. In 1991, the average spending on R&D in OECD countries was 2.3. However, the latest figures available from Statistics Canada suggest Canada spent only 1.43% of its GDP - less than average - on developing new products and searching for new knowledge" (Financial Post, June 26 '93). Some of those involved in the technology development process point to a lack of long-term R&D planning that has led to very limited basic research capabilities that can support applied technology development.

Regulations influence this sector more than most other technology-based industries. Technologies are developed and adopted to meet new regulations and these are ideally imposed when enabling technologies are available. (Doyletech 1992). Government and industry could become partners in ensuring that Ontario suppliers are well positioned to respond by synchronizing technology developments with regulatory enforcement timelines. In many cases Ontario's environmental legislation and standards are not as progressive as other jurisdictions. Progressive legislation drives local market demand while allowing the developer to gain expertise and confidence in a domestic market before entering export markets (Ernst & Young 1993).

As pollution prevention prevails and waste production is reduced, the waste management subsector of the environmental industry is being forced to shift its business focus. The growing trend away from "end of pipe" cleanup technologies to pollution prevention and closed loop systems presents a challenge to Ontario's environmental protection subsector. As emerging technologies solve or prevent current pollution problems they reduce the demand for pollution control equipment. This trend is reflected in the reduced earnings of the waste management subsector which is being forced to shift its business focus as consumers and industries reduce waste output. According to the Wall Street Journal, in 1993 the waste management subsector had the second worst performance of sectors, listed on the stock market. Much of our existing supply capabilities are focused on end-of-process technologies. There is a need to shift our capabilities towards pollution prevention, waste reduction, reuse or recycling, and energy efficiency.

Opportunities:

Our sector has an opportunity to supply a significant portion of Ontario's own growing demand for technologies. The newly created Ontario Centre for Environmental Technology Advancement will facilitate this process for small and medium-sized companies by helping them to partner with established research centres, complementary companies and potential buyers.

Our resource-based industries are restructuring and investing in capital equipment to respond to international market forces (Premier's Council: Competing in the New Global Environment, 1988). Increased resource efficiency and the adoption of environmental technologies is becoming common business practice because of customer/consumer expectations and because it makes basic economic sense (Moore and Miller, 1993). The combination of industry restructuring and the growing adoption of green technologies in resource-based industries provides a unique opportunity to develop these specialized technology needs.

The provision of public infrastructure must be consistent with sustainable development principles. This means making every effort to conserve energy, waste and water before building new hydro, gas, sewer and water lines and landfill capacity. Such a "conservation first" approach offers significant opportunities to develop and apply green technologies. For example, the new Ontario Clean Water Agency (OCWA) requires municipalities to have water conservation plans in place before reviewing requests for capacity expansion. This should open up markets for a range of water conserving technologies.

There are opportunities for public/private partnerships. For example, Ontario Hydro Technologies could work on product development and marketing with private sector companies.

A number of urban development initiatives identify specialized technology needs. The Waterfront Regeneration Trust, an independent agency reporting to the province, has the mandate to clean up and develop the Lower Donlands (Toronto Waterfront). This will offer full scale application and commercial opportunities for site remediation technologies which Ontario suppliers must take advantage of. The concern about contaminated ground water from conventional septic tank systems and other sources (Commission on Planning and Development Reform in Ontario) is another indicator of where future technology development should be focused. The Great Lakes water quality crisis offers an opportunity to demonstrate pollution prevention and monitoring, and water treatment technology under the Cleanup Fund of the federal Great Lakes Action Plan.

Threats:

Hasty infrastructure development, which is inconsistent with sustainable development principles, may employ traditional construction practices and overlook opportunities for green industries to demonstrate resource conservation and alternatives.

Inconsistent application and enforcement of regulations and approval guidelines is impeding technology development in Ontario and discouraging R&D investment because the demand signals for technology are not clear and advanced enough to be able to respond and because Ontario is too small a market to justify the significant development costs for green technologies. There is a prohibitive approvals process and lack of standardized field testing procedures for new products. These factors result in lost opportunities to demonstrate new green technologies in Ontario.

In contrast the U.S. strategy is designed to strengthen export activity in environmental products and services by first of all enhancing domestic technology support infrastructure. The tendency for U.S.-owned Ontario manufacturers to source green technologies in their home country will be reinforced by a streamlined technology support program in the U.S.

Strengths:

Many believe that the availability of capital is not a binding constraint for Ontario's green industry sector. The rapid growth of the green industry sector demonstrates its ability to raise investment finance; however, there is widespread agreement that there are specific problems for companies looking for certain types of early stage finance.

Ontario's financial sector is the largest and most sophisticated in Canada. Borrowers and entrepreneurs have access to a wide range of financial instruments from private, hybrid public/private, and public sources. From the private sector a number of environment-oriented venture capital and mutual funds have been established including: Canadian Venture Founders, Environmental Technologies Inc., Ventures West and the Clean Environment group of funds and Ethical Funds Inc. Capital availability has been enhanced by emerging public/private vehicles such as labour sponsored venture funds (e.g. the Canadian Federation of Labour's Working Ventures, the United Food & Commercial Workers Growth Fund), and the Ontario Investment Fund. Government institutions such as Innovation Ontario also play a key role by investing in small and medium-sized technology based firms.

The financing situation has become even more favourable recently. Several small trade union pension funds are considering setting aside significant sums for environment- related investment. For example, the United Food & Commercial Workers have allocated funds for investment in environmental retrofits.

The provincial government has demonstrated an interest in economic instruments for environmental protection through the work of the Fair Tax Commission. To the extent that the discussed economic instruments are developed and enforced, industries would be more motivated to buy green technologies and this would encourage investment in the sector.

Weaknesses:

Access to finance for the green industry sector is problematic for startup and early stage investment projects because the sector is heavily dependent on new technologies, emerging and regulatory markets and is composed of relatively small firms. A number of studies have confirmed significant and persistent problems for all technology-based startups, and for environmental-related startups in particular (Macdonald 1991, 1992; Canada Consulting Group 1992; NABST 1990; National Biotechnology Advisory Committee 1991; Coopers and Lybrand 1991; Higgins 1993). Ontario companies have difficulty proving to potential investors that their technical claims are true because there is no system of standards for new green products and technologies. Another key problem is finding funds to make the transition from prototype to commercial production (M. MacDonald, 1991).

Two other issues that diminish investment in this sector are negative externalities and fears of environmental liability. Negative externalities relate to the difficulty of raising finance for environmental investments because the benefits are not easily quantified or allocated to one source (e.g. air pollution control equipment or measures

that reduce acid rain). Environmental liability includes concerns about lender liability and from investors' perception that they risk inheriting liability if green technology is not successful (e.g. if soil remediation technology does not clean up contaminated sites to the level anticipated).

The underlying problem is that there is inadequate information on risks and opportunities associated with investment in this sector. If the interpretation and enforcement of Ontario's environmental laws and regulations are inconsistent this discourages investment in our sector by making it less secure compared to other sectors.

Opportunities:

Given the downturn in traditional investment avenues such as real estate and manufacturing, we could facilitate the redirection of capital to this emerging and fast growing green industry sector. For example, more affordable brokerage services for this sector's entrepreneurs would provide access to otherwise prohibitively costly equity markets. The Ontario Investment Corporation is a lead fund umbrella under which "green expert corporations" could be developed. Such corporations would then ease the task of securing investment capital because they would have in house technical/ managerial expertise to assess early stage projects.

Improved education and information about this sector could be strengthened to increase investor knowledge and comfort levels. For example, green industry success stories could be publicized more effectively to educate the financial community about the sector's investment potential.

The general public is clearly willing to invest in environmental expenditures for social, environmental and ethical reasons as well as commercial reasons. These sources of capital funds should be identified and mobilized. Programs such as Canada Trust's Green Accounts, demonstrate consumer receptiveness to the environmental ethic, which the green industry sector supports, and we should explore other ways of mobilizing funds through community- based or non-profit organizations.

Threats:

Excessive interest in the green industry sector could lead to imprudent investments that would tarnish the sector's image. Investors must be well informed about the technical issues and regulatory regimes which are crucial determinants of success or failure in this sector. Retrofit schemes must provide high quality, credible recommendations so that they drive genuine environmental product markets. For example, we must avoid a repeat of the Urea Formaldehyde Retrofit program.

Regulatory regimes in competing jurisdictions are starting to move ahead of Ontario. This presents a problem for continued growth and innovation in local green industries and markets. If industries and markets stagnate, investment in the sector will decline. Leading edge environmental regulations stimulate the market for the green industry sector, which in turn supports investment in the sector. On the other hand when Ontario's regulations and standards lag, local markets will stagnate and obsolete products from more progressive regions are dumped in Ontario, further injuring domestic suppliers (e.g. when Ontario's plumbing code revisions mandating low-flow toilets lagged behind U.S. jurisdictions).

Leading edge regulations can cause difficulties for user industries because of increased costs of production and potential job losses. The only solution is to develop green technologies that allow high regulatory standards to be met at relatively low cost. Increasing the flow of finance into the sector can help achieve this end.

III Strategic Goals

Based on GIMAC's SWOT analysis of Green Industries, there are opportunities to streamline government's support for this sector and encourage the adoption of leading edge technologies, that will benefit Ontario's green industries and strengthen our domestic supply capabilities. This in turn will lead to increased exports of Ontario's green goods and services. Green industries are an instrument for the development and diffusion of environmental technologies and skills throughout the broader economy and will function as a primary agent of restructuring for sustainability.

Ontario exports 15% of our sales and has a trade deficit of about $200 million in the environmental protection subsector alone. (Ernst & Young's 1992 and MITT data). Although trade statistics are unavailable for the broader green industries, the trade deficit is likely to be much larger (consider for example the shortage of Ontario manufacturers of high efficiency appliances, water conservation products and low energy lighting equipment).

If we compare Ontario to a leading European jurisdiction such as Denmark, there is a strong case for increasing export activity to at least 20% of sales in Ontario's environmental industries. Denmark's population and environmental industry is about half the size of Ontario's. However, 50% of their sales are exported, with an estimated 4-10% growth rate in exports (Environment Strategy Europe, 1993). Part of the reason for their success is that their Environment Ministry's corporate strategy promotes the use of environment equipment and clean technologies.

Environmental markets are showing strong growth rates around the world. For example, the U.S. environmental market is currently valued at $120 billion annually and growing at 7% annually over the next 5 years (National Environmental Technology Applications Corporation). The Asia market, led by Taiwan, South Korea and Thailand, is valued at $20 billion and is growing at rates up to 20% annually (Global Environment Fund '92 Market Survey). In Eastern Europe and the former Soviet Union environmental markets are valued at $15 billion with an annual growth rate of 40% (The Delphi Group/SB Capital International from Ernst & Young, International Finance Corp., ISTC, OECD).

Mexico also represents a critical emerging export market for Ontario and would serve as a gateway to the Latin America region. By the end of this decade the Mexican market for pollution control devices alone is expected to be $10 billion (Ernst & Young, 1992). A 5% increase in exports from Ontario's environmental sector could be achieved by capturing only 2.5% of that market, in addition to any export increases that can be achieved in the growing U.S., European and Asia markets.

GIMAC believes that it is necessary to implement our recommendations if the sector is to achieve its forecasted potential of an 8% annual growth rate. Given the strong growth rates expected in international markets GIMAC's goal is to see a 5% increase in export activity. This would mean that over a five year period exports

would rise from 15% to 20% of total sales. This increase in export activity, in addition to the 8% annual growth rate, would create approximately 8,000 new jobs by 1999. About 1600 of these new jobs would be

associated with increased export activity. Implementation of the following eleven recommendations will help achieve this strong level of job creation which is GIMAC's target for the next 5 years. We expect the strong growth in export activity to continue beyond that time period.

IV GIMAC Recommendations: *11 Steps Toward Our Vision*

A. SUPPORT THE USE OF NEW ENVIRONMENTAL TECHNOLOGIES

Recommendation 1. *Devise a certification scheme for green technologies and then support it.*

Background:

The key to building green technology companies is to have demonstration successes at home. Demonstrations are hindered by fear on the part of the purchaser that new technology won't work. Technical risk can be reduced by a certification process, and business risk can be reduced through financial incentives from government.

Implementation:

A working group should conduct a detailed study to evaluate costs/benefits and design an implementation plan for this recommendation. First, organizations such as the Canadian Standards Association, OCETA, and the Canadian Environment Industry Association (CEIA), could develop a certification program addressing management practices of a company, performance characteristics of a product, potential employment and output impacts, and sustainability. Second, the working group should investigate the impact and potential of specific financial incentives for developers and users of certified technologies - for example: capital cost allowances or flow through provisions for investors, and/or subsidies for first-time users of certified technologies.

Recommendation 2: *Encourage procurement relationships between Ontario's green industry and the provincial, regional and municipal governments and crown corporations.*

Background:

Ontario's public sector, which includes ministries and agencies, are major buyers of a variety of goods and services and can support the development of green industries in two ways. Firstly, by taking environmental practices of supplier companies into consideration and secondly, by supporting the development of Ontario suppliers of green products and services. A green procurement policy would motivate suppliers to invest in green technologies, in order that they can qualify as government suppliers. In addition, the Ontario government has its own demands for green products and services. Consequently, it could play a major role in directly supporting green industries by linking the government's long term buying requirements to potential Ontario based suppliers. Ontario would be supporting our sector by indirectly and directly increasing the number of development and demonstration opportunities for exportable, advanced technologies.

Implementation:

Broadly announce and enforce a government-wide policy that makes environmental practices a critical factor in government procurement. Provincial, regional, municipal governments and the broader public sector should require suppliers to follow established environmental practices. These agencies should also be instructed to communicate their long-term needs for environmental goods and services to potential Ontario suppliers. Similarly, green industries should have an opportunity to advise government buyers of new technologies. Finally, long-term research and development programs should be designed to develop technologies that meet buyer needs, using financial incentives and the re-allocation of existing research and development dollars. While the public sector should lead by example, the private sector should also take responsibility to establish its own preferential procurement policies which emphasize environmental practices.

Recommendation 3. *Use Ontario's Industrial Programs to Support Green R&D and Encourage Green Technology.*

Background:

Green industries have tremendous potential for securing new industries and jobs in Ontario and improving the province's environmental quality. As a major force for levering investment and job creation through its many industrial support programs, the Ontario government can contribute to economic, job creation and green industry objectives by encouraging industries that receive government support to develop and adopt green technologies.

Implementation:

Government industry support programs should have an environmental component which includes preferential treatment of applications if industry invests in Ontario based research and development and use of advanced green technologies. For example, companies seeking government industrial assistance should identify recycling and waste, water and energy reduction opportunities in their project. Particular emphasis should be placed on applications which have partnerships between users and suppliers for the purpose of developing and demonstrating new green technology such as pollution prevention and other technologies that address these opportunities. Companies should be required to report on the implementation of these environmental components. The government could also set aside a fixed portion of all industrial R&D programs for environmentally-based applications. The integration of green technologies in all industry sectors will result in benefits to be shared by all Ontarians and will help the long-term viability of these industrial projects.

B. ALIGN ONTARIO GOVERNMENT TO FACILITATE THE USE OF ENVIRONMENTAL TECHNOLOGIES

Recommendation 4: *Ensure environmental policies, programs and regulations are clear, progressive and consistently enforced.*

Background:

Ontario's regulatory standards-setting process should be a stronger force in supporting a domestic market for Ontario's green industries. Regulations must then be enforced consistently to provide a stable and reliable market for green technologies.

Other jurisdictions have developed environmental standards and regulations that are more progressive/aggressive than Ontario's, making it difficult for Ontario suppliers to compete in those markets. One of the responsibilities of government is to assess, and help affected industry anticipate the impact of new regulations. User industries must be able to understand new regulations and green industries should have the ability to identify new opportunities arising from regulations. Conflict between user industries and green industries must be avoided. Progressive regulations in Ontario will stimulate the development, commercialization and production of environmental products and services that can meet standards anywhere in the world. Progressive implies that regulations will be in the long-term interests of the regulated industry as well as green industries and the environment.

Such regulations, coupled with the use of certified technologies (Recommendation 1) and economic instruments (Recommendation 6), will ensure that everyone wins - the government, whose regulations become simpler to develop, the green supplier who gets an opportunity to develop a company from its home base and the user who gets certified technology faster.

Implementation:

Government needs to consult more effectively with industry as to how regulations will be enforced. For example, workshops should be held with affected industries concerning draft regulations to evaluate and identify implementation challenges. Both the Ministry of Environment and Energy and Environment Canada must remove obsolete environmental regulations, streamline remaining regulations and clarify interpretation issues. Ontario regulations should be equal to or better than other jurisdictions. Where long-term mutual benefits for the green industry and government exist, progressive regulations should be developed in consultation with our industry. Regulations of other jurisdictions should be continuously monitored and assessed for possible adoption. Enforcement should be reviewed to ensure uniformity.

Recommendation 5: *Develop policy and a regulatory system that is open to new technologies.*

Background:

The growth of green industries will depend on the identification and development of new business opportunities for domestic and foreign markets. New technology adoption is the key to that process and plays a major role in re-engineering Ontario. Our sector must be consulted in the development and implementation of regulations to ensure that technology opportunities are not overlooked. The green industry sector must be given the necessary lead time to research, develop, demonstrate, acquire approvals and commercialize new technology.

Performance-based regulations generate innovation in developing technology solutions, and will stimulate our sector far more than the traditional prescriptive-based regulations.

Implementation:

Establish a focal point for dialogue between the green industry and the government. An organization could advise and provide input to government on matters such as potential business opportunities, regulation development and implementation, linking regulation to the local development and commercialization of enabling technologies. Participants of this organization could include representation from CEIA and OCETA.

The government should investigate opportunities to use performance-based regulations. Performance standards should be flexible enough to allow for the use of new technologies and techniques to meet these regulations, while government authorities should be permitted to approve innovative green technologies for demonstration purposes. A task force could be established within MOEE to review existing regulations with a view to converting them to performance-based regulations.

Recommendation 6: *Encourage the use of economic instruments when developing regulations.*

Background:

There are strong potential benefits to our sector, the environment, and the government in the use of economic instruments for environmental protection. Instruments to be considered range from effluent charges, pollution taxes and emissions trading to full cost accounting. They would provide a permanent incentive to reduce pollution and encourage the development and installation of pollution prevention technologies. Economic instruments could provide increased demonstration opportunities for the green industry sector, increase capital investment in the sector and offer a leading edge administrative framework for pollution control which enhances the reputation of Ontario's sector in global markets. Current government work on economic instruments may not be fully exploring the range of instruments or recognizing the industrial benefits of these tools, because our sector doesn't have a distinct voice in this work.

Implementation:

It is important that the green industry sector be consulted as well as environmental organizations, labour groups and user industries. A steering group should be established to investigate the design and delivery of specific economic instruments to support the industrial development goals of the green industry sector. The group, which could include representatives from green supplier industry associations, user industries, the investment community, and senior level government staff, would steer the preparation of a report and recommendations for government.

C. ENSURE THAT ONTARIO GREEN INDUSTRIES HAVE SUPPORT MECHANISMS EQUAL TO OR BETTER THAN OTHER JURISDICTIONS

Recommendation 7: *Participate with the federal government to maximize support for Ontario green industries.*

Background:

The new federal government intends to make environmental technologies and services a major component of Canada's strategy for economic growth. In a climate of closer federal/Ontario collaboration, Ontario government and industry representatives can play a positive role by introducing the successes of Ontario's green industry and suggesting ways that the federal and provincial government can act as partners to avoid duplication and to advance our sector.

Implementation:

The Ontario government and CEIA should establish a green industry committee to liaise on a permanent basis with Environment Canada on issues and actions of interest for our sector. For example, the $6 billion federal infrastructure program should include environmental infrastructure such as sewage treatment plants, energy efficient transportation, and site remediation efforts. CEIA, Ontario industry stakeholders and the Ontario government have participated in federal consultations to develop a national environment industries strategy. These Ontario parties will follow through with specific plans to work together in implementation of this federal strategy.

Recommendation 8: *Develop export markets using market intelligence and consortia.*

Background:

Export markets are the best opportunity to develop today's small green companies into tomorrow's market leaders. Our sector has unique marketing needs because it consists primarily of very small firms with highly exportable niche businesses, and the single most important market force is the environmental regulations of a specific geographic market. Clients are buying their green technologies from all over the world, with a preference for turn-key solutions rather than single components. All of this demonstrates a need for distinct market intelligence, export marketing support and consortia formation assistance, in order for our sector to reach its potential in the global market.

Implementation:

Enhance government market support activities and facilitate the formation of consortia/alliances/networks (CANs).

Broad market intelligence sources must be catalogued and made easily accessible to our firms from publicly funded sources such as the federal foreign trade offices and embassies, foreign country consulate in Canada, CIDA, and the World Bank. Then selective investigations for priority export markets and subsectors are required. The use of an electronic bulletin board format could be explored, which would allow for immediate access to, and communication with, other users via modem.

The province's Trade Expansion Program, levered with federal support, must be made more appropriate for the green industry sector by expanding eligibility, financial support levels and the frequency that a firm can apply to it.

Some examples of services that would facilitate the use of CANs are: organized meetings for companies with common geographic or market interests; workshops on technical issues such as legal, financial and business planning for CANs; an electronic bulletin board for users to identify partners and broadcast interests in establishing CANs.

Recommendation 9: *Devise cost effective mechanisms and incentives to help finance Ontario's green industries.*

Background:

A number of creative options to stimulate investment in this emerging sector of the economy have been developed over the past six months by a Green Industry Office task team from the financial community (banks, trust companies, venture capital funds, pension fund managers). The group has examined how current regulations, procedures and institutional structures can be improved to enhance information flows, reduce financial risk and improve risk management for new investment in green industries. Examples include: assisting pension funds to invest in our smaller companies; funding reports on specific companies by investment bankers to generate investor interest; assisting development of green Expert Funds to work with the Ontario Investment Lead Fund and allowing Innovation Ontario and Working Ventures to invest more readily in small Ontario companies (see Appendix 2 for more detail).

Implementation:

The Green Industry Office's Financing Task Team should priorize these options and select those which offer the greatest potential both for enhancing investment in green industries and the adoption of pollution prevention, and which are also potentially acceptable to the government. Further studies should be carried out to address design, delivery and implementation issues.

D. DIFFUSE ENVIRONMENTAL TECHNOLOGIES AND PRACTICES THROUGH GREEN COMMUNITIES AND INDUSTRIES

Recommendation 10. *Develop training initiatives which accelerate the greening of industries and communities.*

Background:

To advance the environmental ethic and change behaviour and attitudes, GIMAC recognizes the importance of working both in communities and with industries. Ontario has piloted integrated green analyses for industries and homes, producing attractive paybacks in energy and water conservation and waste management and expanding markets for our sector. The pilots were developed with stakeholders from environmental groups, labour, the Consulting Engineers of Ontario and MOEE. These projects offer new training and skill development opportunities for the residential market as well as workers who play a key role in pollution prevention in the workplace. A comprehensive home assessment training package has been developed for green communities, and preliminary work has been undertaken with the United Steelworkers of America (USWA) regarding industrial workplace retrofits.

Implementation:

These training activities should be expanded to other industrial sectors and workplaces and residential assessors and contractors. For example, a project could be launched at a specific site where both management and labour are interested in carrying out a green industrial analysis and retrofit, using the USWA work as input. On the residential side, training courses could be offered by institutions such as community colleges for green home assessors as well as contractors and tradespeople who carry out green home retrofits. Current training programs promoting energy efficiency in buildings could be expanded to incorporate water conservation and waste reduction.

Recommendation 11: *Instill environmental values and principles of stewardship at all education levels.*

Background:

When environmental values and stewardship principles are incorporated in the educational curricula and learned at an early age, these principles should be reflected in the communities, industries, products, industrial processes and management systems of the future. The education curricula currently refers to environmental quality issues - the challenge is to increase awareness of environmental technology and its economic development potential in all grades, colleges and universities. Educational curricula can be enhanced with input from organizations with current knowledge of the issues and solutions in the environmental field.

MOEE is involved with two projects which advance environmental stewardship practices in the school system. The **Energy Educators of Ontario** develop material on environmental issues for schoolboards and the **"Greening our Schools"** project

is being delivered in elementary schools in five of Ontario's Green Communities. Additional funding is required to extend the project to other communities and to high schools. These projects should be expanded to stimulate student interest in new technology approaches and demonstrate the potential to harmonize green technologies and economic development.

Implementation:

Labour, industry and government could pursue a partnership arrangement to extend the current environmental education projects to elementary and high schools in more Ontario communities. Representatives from industry and labour could, for example, volunteer to introduce students to practical examples of technological solutions to environmental problems at all educational levels. At the post-secondary education level, engineering courses could be designed to better integrate technical solutions with the theme of environmental sustainability.

V ACTION PLAN

GIMAC believes that these recommendations meet the key goals of the Ontario government's Industrial Policy Framework: move the sector to production of higher value-added products, services and processes, and improve sector competitiveness leading to high quality and secure jobs. Implementation of these recommendations will increase technological capability and promote continuous innovation, raise skill levels, expand Ontario markets, build international capabilities, strengthen linkages with other industry sectors, and help achieve the anticipated 8% annual sector growth rate.

GIMAC has identified the following actions required to begin implementation:

Endorsement and Commitment

- Endorsement by the Ontario government and a commitment to carefully study our report and take action
- Commitment from senior levels of the Ontario government that changes are possible, including changes to the process of developing and enforcing environmental regulations

Implementation

- Development of detailed implementation plans, schedules, and funding proposals for all endorsed recommendations, with industry, government and multi-stakeholder groups.
- Exploration of avenues to support strategy recommendations through Ontario's Sector Partnership Fund
- Identification of green opportunities for other Ontario industry sectors through liaison with other ministerial advisory committees

Monitoring

- Measurement of successes by monitoring results; publicize achievements and successes (increased jobs, exports, improved environmental quality).
- Dialogue between government and stakeholders to be continued.

VI APPENDICES

APPENDIX 1: EXISTING GREEN INDUSTRY INITIATIVES SUPPORTED BY MOEE GREEN INDUSTRY OFFICE

GREEN SUPPLIER DEVELOPMENT INITIATIVES:

Business Development Units: Two Business Development Units (BDU) have been established to work directly with companies with the goal of developing and expanding Ontario-based suppliers of green products, services and technologies. The Ontario Hydro BDU works with manufacturers of energy efficient products, while the Environment BDU works with manufacturers of products promoting pollution prevention and waste reduction/reuse/recycling.

The Ontario Hydro BDU was started in 1991 and has now been incorporated into the Ontario Hydro Technologies Division. Completed projects include: Canterra energy efficient ballasts, Nicholls-Radke waste heat exchangers, and Earth Systems heat pumps. The BDU is currently working on about 20 projects (lighting, ballasts, appliances, motors, heat pumps).

MOEE's Environment BDU is working on 20 green industry projects which, if all come to fruition, will lead to approximately $73 million in new investment and 600 new green jobs. Examples include: recapture/recycling of CFC'S; industrial pallet manufacture from plastic/scrap fibreglass; commercialization of PCB destruction technology; plastics recycling; soil remediation technology.

Work to date has been primarily reactive as companies and entrepreneurs contact the BDUs for assistance in gaining access to government and Hydro programs. In the next phase of activity it is proposed that the BDUs become more proactive by, for example, identifying Ontario supplier opportunities developing from new regulations, policies, and procurement practices.

The Green Industry Office plans to extend the BDU concept to the areas of natural gas efficiency and water conservation. Preliminary discussions have been held with the natural gas industry and with the Ontario Clean Water Agency (OCWA).

Ontario Centre for Environmental Technology Advancement (OCETA): Industry consultation identified the need for a technology transfer centre as a key tool to assist small and medium-sized companies commercialize new environmental technologies and advance Ontario's green industry sector. During 1992 and 1993 Green Industry Office staff worked closely with a number of green industry groups to develop a strong Ontario proposal to access federal funds from the Green Plan and provincial support from the Sector Partnership Fund. In November 1993 OCETA was formally launched in partnership with key sector players: CEIA, City of Toronto Economic Development Corporation, Canadian Institute of Technology for the Environment, Greater Hamilton Technology Enterprise Centre, Ontario Environmental Training

Consortium, ORTECH, Ontario Hydro Technologies, Ottawa Carleton Economic Development Corporation, and Rockcliffe Research Management.

OCETA's services will play a significant role in achieving the technology goals of the Green Industry Strategy by fostering the development and economic competitiveness of small and medium-sized Canadian firms through environmental technology advancement and commercialization. The Green Industry Office and Environment BDU will continue to work closely with OCETA during this initial startup period.

Environmental Financing: A successful workshop was held in spring 1993 for 80 participants from the financial community with the goal of improving financing for Ontario's environmental industries. Following this a number of networks and initiatives have developed. For example, a Financing Task Team with representatives from pension funds, insurance companies, venture capitalists, and investment brokers has developed a series of options requiring further study (see Appendix 2).

Green Industry staff are working with the Biosphere Foundation to pilot the concept of a green bond offered through banks. The interest on the green bonds would be donated on a charitable basis to the Foundation to support community environmental projects, and participating banks would use the bond principal for new environment-related commercial loans.

GREEN MARKET DEVELOPMENT INITIATIVES:

Green Communities: Seven Green Communities are participating in this pilot project - the first North American residential green assessment project. They include: Guelph, Peterborough, Port Hope, Elora and Atikokan, Sarnia, Cornwall. A green home visit is conducted to identify energy, waste, and water saving measures. Canada Trust is a partner providing attractive loans for the home retrofits which result in new markets for contractors and green industries. A key goal is to expand the residential market for key green products and link up Ontario suppliers to these opportunities.

MOEE developed a comprehensive green home assessors training package (first known training system which covers energy, waste and water reduction). Green home assessments began in the summer of 1993. Supplier development work is underway and will be expanded in the next phase of activity as the project is extended to more communities.

Green Industrial Analysis: This pilot project offers industries a site analysis to help them prevent pollution, and reduce waste, water and energy use. Nine green industrial analyses were completed with significant environmental benefits and cost savings identified (average 20% cost savings were identified for companies). The project was designed with the Consulting Engineers of Ontario who have strengthened their skills in this green services sector and are now looking to export the service. Green analyses have identified green product and supplier development opportunities for Ontario industry which are being followed up with Business Development Units.

A standard protocol for green industrial analyses/retrofits is being developed in conjunction with the Consulting Engineers of Ontario to assist in export of this green service. MOEE will be expanding the supplier development work stemming from

retrofits and applying the experience gained to date with the greening of industry to other sectors including: speciality chemicals (paints and glues), electrical electronics, metal fabricating, and food processing and forest products.

SECTOR SUPPORT:

Green Capital Spending: Government infrastructure spending presents an opportunity to ensure that conservation and demand management interests are addressed before expanding supply. For example, OCWA will require that municipalities submit water conservation plans before being eligible for funding for sewer and water infrastructure. This presents opportunities for green products and technologies. Green Industry Office will continue to pursue this approach within government.

Information and Marketing: An initiative is underway with CEIA to develop a database of Ontario green industries. Government is working with industry to ensure a strong Ontario green industry sector presence at marketing events such as Globe '94 in Vancouver.

STAKEHOLDER DIALOGUE:

Green Market Opportunities Program (GMOP): A broad group of industry users and suppliers formed the basis of a process to ensure that industry priorities were being addressed and reflected in the work of the Green Industry Strategy. The GMOP Summary Report was used as one building block in GIMAC's strategy. Several GMOP task team chairs and participants are members of GIMAC, ensuring continuity and representation of GMOP's work in the GIMAC strategy.

GMOP was launched by the Canadian Environment Industry Association - Ontario Chapter (CEIA) and the Green Industry Office at an October '92 workshop. At this meeting, 24 industry groups provided initial feedback on the early stages of the evolving Green Industry Strategy. From this meeting, seven GMOP Task Teams were formed to be the mechanism through which industry could address the issues raised at the workshop. Industry volunteers were recruited from 25 industry associations and about 50 private sector participants to contribute to the following task teams: Guidelines, Idea Identification, Industry participation in Business Development Units, International Market Development, Liability, Regulations, Financing.

The six task teams met from January to June 1993 and produced a report summarizing their recommendations. A brief synopsis of these recommendations follows along with a list of the GMOP Task Team members. A number of GMOP's themes and recommendations have been echoed by GIMAC:

1. Develop a certification scheme for green industries.
2. Implement a provincial green procurement policy.
3. Support the formation of export consortia.
4. Provide an electronic bulletin board for market and technology information exchange.
5. Review of provincial and federal environmental regulations.

SYNOPSIS OF GMOP RECOMMENDATIONS:

(1) Business Development Units (BDUs) Task Team

Objective: To ensure private sector involvement in the activities of the MOEE BDU's operations.

Solutions: (a) **BDU Advisory Panel** Establish a BDU Advisory Panel that is also linked to the proposed Green Industry Minister's Advisory Committee (GIMAC).

(b) **Publicity Campaign** Use industry newsletters to increase level of awareness of GIS and BDU. Write quarterly press releases for distribution to a wide range of industry associations for insertion in their regular publications and mailings.

(2) Guidelines Task Team

Objective: Determine specific types of guidelines that will support Ontario's green industries and devise an approach to develop such guidelines.

Solutions: (a) **Certification/Accreditation/Licensing for Products/Organizations/Practitioners** Establish process for certification of products and organizations to ensure a consistent standard of quality from industries such as testing laboratories and environmental engineering. Develop accreditation program for practitioners to cover individual professionals so that chemists and biologists are regulated in the same way as professional engineers.

(b) **Green Assessment Protocol** Develop a protocol to cover assessments for energy and water use as well as waste minimization and pollution prevention.

(c) **Green Practices Guideline** Produce a guide for companies that wish to be proactive and go beyond compliance.

(d) **Green Procurement Policy** Introduce a mandatory policy for government buying practices with maximum provincial content.

(3) Idea Identification Task Team:

Objective: To design a model program to identify, develop and implement innovative green ideas, technologies and processes.

Solution: Institute an industry/government collaborative service that collects and distributes ideas/emerging technology information and matches them to local needs.

(4) International Market Development Task Team

Objective: To develop programs that will assist Ontario green industries in their efforts to penetrate export markets.

Solutions: (a) **Ontario Based Consortia** Under the joint leadership of industry and the Green Industry Office, implement activities that will foster the foundation of export consortia activities among Ontario green industries. This approach allow member firms to consolidate their competitive strengths and to compete more effectively for offshore contracts.

(b) Workshop: International Financing for Environmental Projects Conduct a workshop with presentations from the World Bank, Interamerican Bank for Development and Asian Development Bank, to inform companies about how to participate in projects in developing countries. Government representatives specializing in export activities should also be available for consultation.

(c) Environmental Bulletin Board Initiate an electronic information system which users can access through networks. Types of information maintained would ideally include industry directories, legislative and regulatory material, standards, directory of industry associations, contacts for government and commercial intelligence services and financing sources.

(5) Liability Task Team

Objective: To develop a comprehensive approach to dealing with Green Industry barriers related to environmental liability, covering all stakeholders in the process.

Solutions: The following recommendations will promote Green Industries by clarifying the legal and financial risks and responsibilities for this industry and its user industries, and by promoting stable and predictable markets for green services and products.

(a) Uncertainty: Clarify/Codify Policies and Procedures Provide more guidance is needed in terms of:

- what is clean
- who is liable
- who is beneficiary (vs. polluter)
- what is an incident
- how to interpret regional discrepancies in interpretation/enforcement

(b) Lender Liability: Secured Receiver Exemption and Supporting Guidelines Exempt lenders from liability costs of environmental cleanup under certain circumstances.

(c) Corporate Liability: Ensure reasonable limits and confidentiality for former and existing owners.

(d) Director/Officer Liability:

Explore alternate tools to change corporate behaviour.

(e) Insurance Products:

Clarify standards and legislation to provide stable conditions for underwriting decisions that can be based on meaningful risk analysis.

(6) Regulations Task Team

Objective: To develop proposals for the provincial government which would lead to a holistic approach to regulations and legislation and incorporate the principles of multi-media approaches, pollution prevention, voluntary programs, harmonization, and streamlined processes.

Solutions: It is estimated that the first three recommendations could be implemented in the short-term (6-12 months), while the remaining four are considered longer term activities.

a. **Adopt a consolidated Emission Inventory Database**

b **Conduct Task Team Initiated Mini-Regulatory Reviews**

c. **Use Industry Led Multi-Stakeholder Regulatory Review Committees**

d. **Design a Holistic Regulatory Process for Ontario**

e. **Harmonize Regulations Across Jurisdictions**

f. **Provide Technical Assistance to Support Pollution Prevention Principle**

g. **Apply Cost Benefit Principles to New Regulations**

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APPENDIX 2: OPTIONS FOR FINANCE INITIATIVES

The Green Industry Office has been working with representatives of the financial sector to examine mechanisms to encourage investment in the Green Industry sector. A number of tentative recommendations have been identified as a promising basis for future policy recommendations:

1. Assist non-taxed entities, i.e. labour pension funds and RRSP funds, in creating joint pools with taxed investors that would invest in small private companies, by devising flow through arrangements that allow non-taxed investors to derive benefits equivalent to those derived by taxed investors via various tax allowances.

Background: At present it is extremely difficult for funds from taxed and non-taxes institutions to flow jointly into an environmental expert corporation.

2. Encourage small firms to use underwriting services to gain access to capital markets by financing a share of the costs on a recoverable basis if ventures are accepted by an accredited underwriter or broker. The proposal envisages a preliminary screening (40% of cost) and a final phase (60%).

Background: Green entrepreneurs seeking startup financing could increase their chances of success by drawing on the brokerage industry's knowledge and expertise, but often find the costs prohibitive at an early stage of their project. This obstacle could be reduced by a plan that defrayed a portion of those costs on a repayable basis.

3. Examine the relaxation of Ontario Securities Commission disclosure requirements which impede access to capital markets by small private firms.

Background: Extensive reporting requirements of the Ontario Securities Commission impose high costs on small firms seeking to raise money from private investors.

4. Devise a stock savings plan similar to Quebec's which would encourage investment in small Ontario companies by providing clearly targeted tax incentives.

Background: Under the Quebec Stock Savings Plan (QSSP) more favourable tax treatment is provided to relatively long-term investments in small or medium- sized Quebec based firms. The purchase price is tax deductible as long as the investment is held for at least two years. This program has significantly increased employment and the capitalization of small and medium-sized firms (Montreal Stock Exchange, 1989).

5. Design a revenue neutral flowthrough scheme allowing investors to deduct a proportion of employment expenditure (not resource exploration expenditures) from taxable income.

Background: Under a flowthrough scheme if a company has tax deductions that they cannot use, they flow directly to the investors. Instead of allowing resource exploration expenditures to flow through to investors, it would allow employment expenditures to be treated this way. The program should be designed as revenue neutral at first because of current financial constraints.

6. Fund research reports on environmental companies by investment bankers in order to improve information flows and to generate greater investor interest.

Background: The investment community does not routinely produce periodic research reports on this sector now because the volume of investment into this sector is not yet large enough. Investor comfort levels could be increased by a jointly funded, public/private initiative that commissioned such research reports.

7. Assist in the formation of environmental Expert Funds to work with the Ontario Investment Fund's recently established Lead Fund. Find ways of allowing Innovation Ontario and Working Ventures to invest more readily in small Ontario companies.

8. Devise ways of mobilising funds through local, community-based or charitable organisations to promote environmental awareness and sustainability.

Background: The newly established Biosphere Foundation is about to market a Biobond through the a major Canadian bank. Interest earnings on these bonds will be donated to the Foundation on a charitable basis to be used for a range of environmental purposes. Meanwhile, the bank undertakes to increase its environmental lending in proportion to the value of the bonds sold. A large potential market for such bonds was established in a 1993 market survey, and a pilot scheme will be launched in summer 1994 to test that market. The funds from this initiative, together with funds from similar programs such as Canada Trust's Green Accounts, can play a very important role in realizing opportunities in the green industry sector.

APPENDIX 3: GLOSSARY

Certification Scheme: Raised in recommendation 1 and will require further development. In the broadest sense, a certification scheme refers to environmental technologies, services and producing companies which meet established criteria dealing with product performance and reliability.

Commercialization: Moving technology development from the R&D stage in the lab to the stage where goods and services are produced, to service a market.

Competitiveness: Refers to strengthening the green industry sector to secure its position as a key growth sector in the domestic economy and to improve the ability of the sector to succeed in export markets. Helping to improve sector competitiveness does not imply it will be achieved at any social or environmental cost.

Crown Corporation: A corporation that is accountable through a minister to the Ontario legislature and has a board of directors who are appointed by the province.

Early stage investment: Refers primarily to the high risk investment required for the two earliest stages of company growth, namely startup and development. Startup investment is required to establish a new company, to develop a working prototype and to establish markets. Development financing is required for field testing and to begin commercialization of the product. Both stages of investments are usually negative cash flow.

Energy services company (ESCO): Companies that perform a complete service including energy audits, retrofits of buildings and operations in all sectors, in order to identify cost-effective measures to achieve energy efficiency. In most cases, the costs of the retrofits are financed over time out of the resulting saving so that little or no capital expenditure is incurred by the customer.

Environmental Practices: Those practices that are consistent with environmental quality and sustainability.

Expert Corporation: Venture capital companies that invest in startups or early stage ventures in specific sectors of the economy (e.g. a green expert corporation is one that invests specifically in the green industry sector). These corporations have strong technical expertise in addition to financial and management skills. Some venture capital companies are actively involved and have a 'hands on' management approach with companies in which they invest.

Externalities: Indirect benefits or costs that are not reflected in the income or expenditure of a project or firm. Externalities are usually not taken into account when making decisions about technology choice or design of development projects. An example of a negative externality is river pollution resulting from manufacturing of a product. The cost of cleanup or equipment redesign are not identified by the producer; however the pollution affects and costs society.

Flowthrough programs: A variant of the flowthrough shares program which allowed mineral exploration firms to allow unclaimed tax credits for exploration expenses to flow though to their shareholders.

Government procurement: Government purchasing of goods and services for public sector use.

Greening industry: The adoption by all other industrial sectors of environmental technologies and practices.

Green technologies: Refers to the broad range of technologies, processes, goods and services which contribute to environmental quality through pollution prevention, energy and water conservation, waste and water saving technologies and renewable and alternative energy.

Institutional investors: Refers primarily to pension funds, mutual funds and insurance companies, which control the bulk of Canada's resources available for investment.

ISO TC 207: Standards for environmental management systems which are currently being developed by the International Organization for Standardization (ISO). Canada, through the Standards Council of Canada (SCC) and the Canadian Standards Association (CSA), has the lead role in the international effort to develop these standards which will help companies minimize their impact on the environment. The first standards under the 14,000 series are expected to be available to industries and regulators starting in 1995.

Leading Edge Regulations: Regulations which may require the development of new products, services and even technology to meet environmental standards.

Progressive regulations: Regulations that are developed to maximize environmental protection while recognizing economic realities and the ability of technology to meet regulation. For example, the California car emissions standards, requiring 2 to 5% of car sales to be zero emissions, stimulate industry enough to develop new technologies to meet the regulation.

Quebec stock saving plan: A Quebec plan that allows investors to deduct the purchase price of eligible stocks from small and medium-sized companies from taxable income, subject to certain conditions including the need to hold the shares for at least 2 years.

Regulations: Refers to regulations that pertain to the quality of the environment.

Supplier development: Encouraging the growth of competitive Ontario-based firms (ie. suppliers) producing green products or services.

Sustainable development: Development that meets the needs of the present without comprising the ability of future generations to meet their own needs. (World Commission on Environment and Development, Our Common Future, April 1987).

APPENDIX 4: ACRONYMS

BDU ..... Business Development Units - Gas and Water

CANS ..... Consortia/Alliances/Networks

CANMET ..... Canada Centre for Mineral and Energy Technology

CEIA ..... Canadian Environment Industry Association (Ontario Chapter)

CIDA ..... Canadian International Development Agency

CSA ..... Canadian Standards Association

GIAR ..... Green Industrial Analysis Retrofit

GIMAC ..... Green Industry Ministerial Advisory Committee

GMOP ..... Green Market Opportunities Program

ESCO ..... Energy Services Company

MEDT ..... Ministry of Economic Development and Trade

MISA ..... Municipal Industrial Strategy for Abatement

MOEE ..... Ministry of Environment and Energy

NAFTA ..... North American Free Trade Agreement

OCETA ..... Ontario Centre for Environmental Technology Advancement

OCWA ..... Ontario Clean Water Agency

SPF ..... Sector Partnership Fund

USWA ..... United Steelworkers of America

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